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Abstract

Sports betting products rely upon a balance between their knowledge and chance based structural characteristics. The emphasis by bookmakers on mastering the knowledge-based elements to become winners poses significant challenges for those seeking help for gambling disorder. Bettors find difficulties in integrating their preconceptions about the role of knowledge and skills in winning into the new cognitive restructuring fostered by cognitive-behavioural therapy (CBT). Using a grounded theory approach, this study collected data from 43 Spanish sports bettors undergoing treatment for gambling disorder. The results suggest sports bettors neutralise some gambling-related cognitive distortions during CBT but retain others. Sports bettors try to eliminate them but encounter external validation to retain them, as well as internal incongruences to integrate them into a coherent understanding of how gambling works.

Introduction

Individuals seeking treatment for gambling disorder have historically reported fast and high event frequency games (e.g., slot machines) as their most prevalent mode of gambling (Harris & Griffiths, 2018; Petry, 2003), although many times different gambling forms co-occur. This situation has begun to change in the last decade, partially due to the structural modifications (e.g., in-play betting) that the internet brought upon gambling product design (Griffiths, Wardle, Orford, Sproston, & Erens, 2009), but also by other situational transformations such as greater availability and accessibility, and more detailed legal frameworks in multiple jurisdictions across the globe (Lopez-Gonzalez & Griffiths, 2016). Among the gambling products that have benefited from such transformation is sports betting, which has experienced a large growth in many territories while other forms of gambling have stagnated or declined (Gainsbury et al., 2015). Betting on sports is increasingly being referred to by treatment-seeking gamblers as their most prevalent mode of gambling in Australia (Hing, Russell, Gainsbury, & Blaszczynski, 2015),

and is also rising rapidly in Spain, where the present study was conducted (Directorate General for the Regulation of Gambling, 2017).

The way gambling products are designed (i.e., their structural characteristics) has a strong influence on how gamblers perceive such products and their ability to win with them (Parke & Griffiths, 2007; Schüll, 2012). Sports betting differs from other gambling products such as lottery, most slot machines, roulette, and bingo, in that it is structured as a combination of skills and chance, similar to poker and blackjack, and other forms of betting. This combination encourages bettors to overestimate the role their own sports knowledge plays in securing winnings, while making some individuals underestimate how significant the role of chance is, and is something further reinforced by sports betting advertising stimuli (Lopez-Gonzalez, Estévez, & Griffiths, 2018a).

However, statistical simulations repeatedly indicate that, irrespective of the bettors' perceived or actual skills, sports betting does not provide long-term opportunities to profit for a vast majority of bettors (Budimir & Jelaska, 2017). This is especially true when bettors follow the supposedly attractive marketing enticements promoted by bookmakers, which often entail a larger *overround* (i.e., profit margin for bookmakers) (Newall, 2015; 2018). Furthermore, for some gamblers, it is difficult to decipher whether they are making a profit or not because some gambling designs disguise losses as wins, and distort the gamblers' perception of their net winnings, ignoring that multiple gross wins might still equate to a net loss, a situation that often occurs in sports betting contexts (Jensen et al., 2013).

The balance of knowledge versus chance

The design of a gambling product in terms of its balance of knowledge/skills versus chance is paramount to understand how gamblers perceive it. The greater the skills involved in a game are, the more significant the cognitive biases associated with being a skilful gambler are likely to be (Griffiths, 1994). Studies have found that heavy gamblers exhibit more cognitive distortions and biases in skill games than in non-skill games (Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997). Data from the Norwegian national survey on gambling habits showed that among high frequency gamblers, less skilled-based games (e.g., bingo cards, slot machines) showed more irrational thinking, perhaps because these games have structural characteristics that encourage superstitious thinking while more skills-based games

involved more knowledge-based cognitive distortions (Lund, 2011). In this regard, the illusion of control has been found to be more associated with skill-based games than non-skill games (Stark, 2014). Qualitative studies examining the role of knowledge in gambling have been relatively rare. However, Ohtsuka (2013) conducted a study with 49 poker machine players and reported that those gamblers with secondary education (or lower) thought poker to be a game of luck more often than college-educated gamblers who believed more in strategic approaches to gambling.

Beliefs that knowledge and skills play a part in successful gambling are present in both problem and non-problem gamblers. As Stark (2014) noted, cognitive biases, the gambler's fallacy, and the illusion of control are common to all the pathways theorised in the integral pathways model of problem gambling (Blaszczynski & Nower, 2002), which means they almost always play a role in developing the disorder. However, problem gamblers resort more often to luck than non-problem gamblers (which is viewed by them as a personal characteristic), as well as magical thinking as explanatory mechanisms of game outcomes (Teed, Finlay, Marmurek, Colwell, & Newby-Clark, 2012). Similarly, problem gamblers tend to be more irrational in their perceptions, as indicated by stronger beliefs in the role of skilful play in chance activities, and that gambling is a potentially profitable activity (Delfabbro, Lahn, & Grabosky, 2006). Similar results were found in a study with Norwegian gamblers (Myrseth, Brunborg, & Eidem, 2010), in which problem gamblers reported more cognitive distortions than non-problem gamblers. Also, those who played skill-based games had more cognitive distortions than those only playing chance-based games. A telephone survey with young adults in Australia showed that skill-based gambling activities were more associated with problem gambling than chance-based activities, perhaps because individuals gamble more money when they feel more confident in their control over the outcome (Boldero & Bell, 2012).

In the specific case of sports betting, the balance of knowledge/skills versus chance is arguably further skewed towards the overestimation of the impact of knowledge, with some structural characteristics of online sports betting facilitating it (Lopez-Gonzalez, Estévez, & Griffiths, 2018b). Sports bettors, like other gamblers, see their gambling reinforced when they receive group membership or praise as rewards for participating in gambling (Raylu & Oei, 2002). Gambling on sports has been found to be a form of bragging, by which bettors demonstrate to peers their knowledge about sports and their ability to prevail

over other member groups (Deans, Thomas, Daube, & Derevensky, 2016; Gordon, Gurrieri, & Chapman, 2015). In addition, some gamblers who engage in skill-based gambling such as sports betting see themselves as professional gamblers, who with training and game data analysis, can convert gambling into a career path (Hing, Russell, Gainsbury, & Blaszczynski, 2016).

The challenges for therapy of skill-based gambling

Irrational beliefs and cognitions are context-bound, and are more likely to occur in environments that promote such cognitive distortions (Delfabbro, 2004). Gamblers seeking treatment for sports betting-related harm present many of the common symptoms associated with gambling disorder, but also have some idiosyncrasies related to skill-based games. A systematic review of studies utilizing cognitive-behavioural therapy (CBT) treatments conducting cognitive restructuring among problem gamblers showed that the growth of help-seeking individuals gambling on skill-based games created a challenge for therapists. These individuals presented a distinct gambler profile and different patterns of cognition than primarily chance-based problem gamblers (Chrétien, Giroux, Goulet, Jacques, & Bouchard, 2017). In the particular case of sports betting, gamblers arguably resort to a more biased thinking pattern to enhance their sense of control and winning probability when they have an emotional involvement with that gambling form, as it happens in the sentimental bonds nurtured between bettors and their teams and/or athletes. A reference would help here – I think we mentioned something similar in one of our papers on advertising appealing to gamblers supporting their teams

It has been broadly accepted that a greater emphasis on rationally dismantling gambling-related cognitive biases (e.g., teaching mathematical skills) would equate to adolescents being less likely inclined to irrational thoughts about gambling. This assumption has not proved to be entirely correct (Benhsain & Ladouceur, 2004). Knowing about mathematics reduces cognitive biases, even after six months, but does not modify gambling behaviour (Williams & Connolly, 2006). Delfabbro et al. (2006) argued that the pathway to cognitive biases in young people does not depend on objective and factual information about odds or probabilities but about their own attitudes towards gambling. This is also the case in adults. Among adults, gamblers are not less knowledgeable on mathematics and other skills than non-gamblers, emphasizing the necessity of focusing on different aspects of the CBT to address their cognitive distortions (Fortune & Goodie, 2012). This is very relevant for sports bettors in treatment because,

although CBT is sometimes unable to restructure their biased cognitions concerning the importance of knowledge about sports to win money in the long run, CBT is still beneficial for them and can provide other non-cognitive positive outcomes such as abstinence, reduced exposition to gambling stimuli, and a focus shift towards other life interests unrelated to gambling.

The present study explores how sports bettors undergoing treatment for gambling disorder navigate the balance of knowledge/skills versus chance inherent to sports betting products. The paper focuses on the way bettors make sense of the impact that knowledge/skills (henceforth referred to as 'knowledge') has on their cognitions about sports betting, and how such knowledge (or lack thereof) contributed to the development of their gambling problems. Using a qualitative interview design, the study investigates how bettors integrate the newly acquired cognitions from CBT with their pre-existing cognitions about how sports betting works and how important *knowing about sports* is, and the kind of struggles that are encountered when trying to integrate both sets of cognitions.

Methods

Recruitment and data collection

A total of 43 participants were recruited to participate in seven focus groups (FGs). The research team contacted the *Federacion Española de Jugadores de Azar Rehabilitados* (FEJAR; Spanish Federation of Rehabilitated Gamblers), which is the largest nationwide federation of people with gambling disorder in Spain. Regional associations pertaining to FEJAR were contacted by email and offered the opportunity to participate in the FGs. The call for participants specified that the sole inclusion criterion was that sports betting had to be their prevalent gambling activity. Five associations responded to the call for participation, and FGs were set up on location, with the first author traveling to their premises between April and June 2017. In addition, another FG was held in the pathological gambling unit of a hospital, following equivalent criteria of recruitment. All the participants had been diagnosed with gambling disorder prior to the study, and were either currently undergoing treatment consisting in CBT or had recently completed it. CBT in FEJAR typically consists of 3-5 months of weekly sessions (individual and group), plus monthly catch-up sessions until the end of treatment. The diagnosis was based on either the NODS (National Opinion Research Center, 1999) or a Spanish adaptation of the DSM-IV criteria

(Jiménez-Murcia et al., 2009), as well as in individual interviews with psychologist trained in behavioural addictions who confirmed the diagnosis.

Altogether, 43 male participants (no females met the inclusion criteria) comprised seven FGs in six different Spanish cities. FG 1 was conducted in Barakaldo, Basque Country region ($n=7$; $M_{age} = 29.1$ years, $SD = 8.13$). FG 2 in Vigo, Galicia ($n=5$; $M_{age} = 31$ years, $SD = 13.1$). FG 3 in Coruña, Galicia ($n=12$; $M_{age} = 34$ years, $SD = 10.9$). FG 4 ($n=6$; $M_{age} = 36.5$ years, $SD = 9.1$) and FG 5 ($n=3$; $M_{age} = 31.6$ years, $SD = 9.5$) in Madrid. FG 6 in Pamplona, Navarre ($n=6$; $M_{age} = 33.6$ years, $SD = 8.6$). Finally, FG 7 in Barcelona, Catalonia ($n=4$; $M_{age} = 36.7$ years, $SD = 4.3$). The mean age for all participants was 33.2 years ($SD = 9.3$). All quotes selected in the present paper are accompanied by a participant identifier (e.g., 'P6' refers to 'Participant 6'). Ethical approval was obtained from the first author's university in concord with the Declaration of Helsinki. Participants signed consent forms and were reassured of their rights of withdrawal, confidentiality, and anonymity. FGs lasted approximately 90 minutes each and were all audiotaped. Participants received a gift with an approximate value of €10 for their contribution to the study.

Analytical approach

The data analysed in this study were part of a larger project using a focus group design of sports bettors undergoing treatment for gambling disorder. The broad aim of the project was to understand how sports bettors perceived different cultural stimuli that might have spurred their gambling habit and/or discouraged discontinuing gambling. These stimuli were specific to sports betting context, and focused on the situational and structural characteristics of betting (Parke & Griffiths, 2007), especially those derived from the development of new online features to gamble (McCormack & Griffiths, 2013), as opposed to the individual characteristics. Among the most prominent cultural stimuli explored were advertising and marketing strategies used by bookmakers to promote betting. These strategies guided the questions during the focus group conversations. Nevertheless, once the material from the groups was collected, new themes – which were not anticipated in the original design of the focus groups – emerged in the analysis.

The analytical examination of the data stemmed from the principles of Grounded Theory (GT), as understood by Strauss and Corbin (1998). The research team worked under the assumption that, *grounded*

in the comments made by participants to unrelated questions, new theoretical models could better explain the collected data. The coding and interpretation method was structured in a way that the themes presupposed in the FG scripts (and thus implied by the questions asked to the participants) would not be necessarily the same as the resulting themes obtained after the data analysis. GT allows researchers to approach analysis and build theory in an inductive manner, as detached as possible from preconceived theorisations about data (Charmaz, 2006).

In the present study, data were explored in repeated cycles to allow immersion, performing stepwise consecutive coding methods as proposed by Saldaña (2009). A *holistic* coding was first performed to delineate the data in broad categories. The continuous and circular analysis of the data generated more refined themes that departed from the original themes implied in the interview scripts, generating ‘a central or core category’ (Strauss & Corbin, 1998, p. 146). Following this, a new round of coding (*structural* coding) was conducted, specifically structured around the new core category, generating sub-themes around this core. Extracts that vividly illustrated the theme were also coded at this stage (*in vivo* coding). Finally, once all the data relevant to the proposed theme was recoded, a *theoretical* coding was conducted to check whether the theories put forward aligned well and were effectively *grounded* in the data.

The data were coded using QSR NVivo 10 for Mac. A third-party company was hired to transcribe the interviews. Although number of themes initially identified and number of mentions to those themes are identified (see Table 1 in next section), the exact number of participants adhering to each theme is not reported given the qualitative approach of the study. However, some expressions are used to indicate approximate endorsement: ‘most’ (80% of the participants or higher); ‘many’ (50-79%); ‘some’ (20-49%), and ‘a few’ (19% or below).

Results and preliminary discussion

Overview of themes

The initial coding of the data (*holistic* coding) helped identify 50 different themes. These findings are summarised in Table 1, which shows how prevalent each theme was in the interviews, and the number of

FGs in which they were discussed by participants. Once these themes were outlined, the results were considered and discussed among the research team, and a core central theme was proposed based on the preponderance of ‘cognitive distortions’. A second cycle of coding (*structural*) focused on whether other themes previously identified in different categories also contributed to the understanding of cognitive distortions. At this point, other themes were added (in bold within Table 1) to the ‘cognitive distortions’ core theme.

INSERT TABLE 1 AROUND HERE

The inclusion of other themes initially considered to have nothing to do with cognitive distortions was guided by theoretical significance (*theoretical* coding). The theoretical coding posed the major challenge in the understanding of the findings of the study. The close and repeated examination of the data covered by the themes ‘cognitive distortions’, ‘role of knowledge’, ‘tipsters’, ‘near-miss cognitions’, and ‘accumulators’ appeared to describe a core central theme that was pre-emptively named as ‘cognitions about the role of knowledge versus chance’. This core theme was defined as the process of bettors in recovery in making sense of their cognitions and beliefs about how sports betting products worked (their design), and their struggle to integrate such cognitions and beliefs with the learning and cognitive restructuring involved in CBT.

Abandoned and persistent cognitions: The role of addiction

Emerging from this redefined core theme, participants covertly manifested two differentiated groups of cognitions about sports betting products: (i) abandoned cognitions as an effect of therapy; and (ii) persistent cognitions during/after therapy. Abandoned cognitions included uncritical thinking about gambling myths or pseudo-facts (e.g., injuries in Euroleague basketball are more determinant than in other competitions [P24, 39 years]; predicting breaks of service in women’s tennis is easier than in men’s [P38, 24 years]). Also, betting *systems* that bettors believed to increase their winning probability (e.g., in football, wagering that nil-nil draws will conclude with +0.5 goals [P20, 40 years]). Other cognitions involved the understanding of probabilities implied by odds as a spectrum instead of a win or lose dichotomous propositions, as explained by this participant:

“You get to a point, in my experience, where probability of bets are 50%, it’s either I win or I lose, 50%. We now know that probability is one in 99,000, so to speak, but not for me. When I was sick, it was I win or I lose. I hit the jackpot or I leave after losing everything” (P36, 41 years).

However, despite undergoing CBT, a number of latent cognitions regarding the interaction of knowledge and chance in sports betting persisted at the time of the interviews. Some bettors were not able to acknowledge the inherent imbalance of the bookmaker-bettor relationship, in which bookmakers minimize exposition to chance by designing biased odds that give them an edge over consumers in the long run regardless of game outcomes. Participants were prone to acknowledge deception in advertising (e.g., the difficulties in cashing money from free bonuses, or the exaggeration of welcome bonuses), but were reluctant to think that the bookmaker-bettor interaction was not conceived as an equal opportunity setting. In essence, this meant that while bettors broadly thought of bookmakers as evil corporations (e.g., *“nobody gives anything for nothing. They’re giving us free bonuses to make us continue gambling. They have it perfectly studied”* [P8, 48 years]), they tended to think that the asymmetrical relationship between bookmakers and themselves (i.e., the bookmaker winning more frequently than they were) was due to something other than the biased betting product design itself.

Such distorted cognitions about betting products manifested in two ways: (i) lack of references to betting design favouring bookmakers; and (ii) references to alternative explanations to bookmakers’ greater success. Many bettors argued that bookmakers win more because they have access to and manage better quality sports information, or because they have more analytical power to predict games. Consistent with this view of the equal opportunity setting is the fact some bettors cited acquaintances who had been kicked out of betting sites because of their winning record (something bookmakers acknowledge), or a few bettors that cited the likely existence of other bettors *“who must be making millions”* (P38, 24 years). Another persistent cognition among a few participants about how betting products work was the winning probability attached to long-term betting. Here, a latent confusion appeared to be operating, epitomised in the understanding that big stakes on short odds games over a long period produce marginal (but constant) profits:

“We know that betting every week €100 on FC Barcelona or Real Madrid [currently the two best soccer teams in Spain], we’ll win €40, but that’s not what we’re after [...] You’ll win more than you’ll lose, but stakes must be bigger to make a small profit because odds are short” (P40, 39 years).

The persistent cognitions and beliefs about the probability of winning involved in betting were sometimes associated with the role that gambling disorder played in their gambling behaviour. An underlying cognition appeared to emerge after closer examination of data. The basic mental process of this cognition is outlined in Figure 1, which visually summarizes the following idea: bettors believe that a successful event prediction is the result of a balance between the amount of knowledge one can possess over that specific event, and an uncontrollable amount of chance. Among healthy bettors, the balance between knowledge versus chance in one hand, and a successful prediction on the other hand, is direct and non-mediated. However, among those bettors like themselves who suffer an addiction to gambling, this relationship is moderated by such addiction. Following this logic, the addiction (i.e., gambling disorder) reduces the proportion of knowledge in the game and increases the proportion of chance; therefore, they become more exposed to losing. Stemming from this cognition is the implicit belief that, had an addiction not set in, they would have been able to navigate the balance of knowledge versus chance, and produce consistent winnings.

INSERT FIGURE 1 ABOUT HERE

Traces of such hypothesised model are evidenced in the manner participants describe their mental processing when betting and make sense of the role of addiction in it. Bettors appear to acknowledge a *rational* way of thinking and preparing for betting, navigating the odds while controlling for chance, and collecting the relevant information that could help them to make informed decisions. However, the causal connection between a meticulous, rational process of knowledge-based preparation and a successful prediction is broken by the irruption of a disorder, and addiction to gamble, that prevents them from acting rationally. In the following two examples, three bettors described how addiction turned their inner rational bettor into an irrational one.

“There is a phase where you think your selections, but later you move on to a moment in which everything is about betting [...] you bet because you need the adrenaline” (P41, 35 years).

“In the morning, I’d take paper and a pen and do everything with calm and all that jazz. But later, the day used to drive me by impulse...” (P10, 28 years). Another participant interrupts: “Indeed. I used to begin the day by taking notes on my phone, upload my selections in an app, check the latest results... But later in the day (and depending on whether I also played roulette), if I lost, I’d go for short odds and end up losing it all” (P11, 20 years).

The excerpts illustrate a three-phase process consisting of an initial rational phase, the progressive emergence of the addictive thirst through the day, and a final phase of loss of control. This way of interpreting their gambling past infers that, given the absence of a gambling disorder, betting could have been a lucrative endeavour, and that for those who do not suffer from it, beating bookmakers is possible. One of the findings during the re-coding process was the repeated use of the words ‘*después*’ or ‘*luego*’ – ‘after’ and ‘later’, respectively – to mark the transition from knowledge-led and chance-avoidant patterns of deciphering probabilities to more risk-seeking, impulsive betting schemes. The importance of such word choice (15 uses of these words were identified) is not as relevant in relation to their acknowledgement of the negative impact of their addiction, as in their implicit recognition of a pre-addiction state in which a fair and equal bettor–bookmaker relationship can realistically take place. Addiction came in *later*, so the errors in cognition that happened *before* were not inherently misguided.

Barriers to integrating CBT learning with knowledge versus chance balance

Participants in the study generally acknowledged the effects of CBT in neutralising long-held cognitions and beliefs about how gambling works. Most bettors considered they had overcome the effect of well-known biases such as the gambler’s fallacy, or the internal attribution of winnings and the external attribution of losses. Bettors were not defensive about the role that chance played in their behaviour, and were happy to confirm their overestimation of knowledge. Nonetheless, their comments suggested that CBT *only deactivated* a portion of the cognitions and beliefs about sports betting. CBT’s cognitive restructuring was unable to neutralise more persistent forms of betting-related cognitions such as the ones

discussed in the previous section (i.e., the enhanced probability of winning in long-term betting, or the impact that their addiction had on the winning likelihood).

Some bettors appeared to struggle to integrate into their pre-treatment understanding the lessons learned during CBT concerning the balance of knowledge versus chance. Participants expected that the development of the CBT would force them to question most of their pre-acquired ideas regarding gambling. In their minds, CBT should have reconfigured their cognitions to leave them thinking that sports betting is an activity purely based on chance wherein knowledge plays no significant part. However, when CBT failed to supply all the necessary answers to neutralise their preconceptions about the role of knowledge in sports betting, they fought to put back together a congruent narrative. One participant summed up the internal incongruences that bettors in recovery faced:

“This [importance of knowledge in sports betting] is something I often think about. It’s inside me and I want to get rid of it. In fact, I want somebody to come here and show with documents that this is all pure chance... that’s what I want. Because I have this espinita (literally, little thorn) I want to get rid of. Researcher intervenes: The thing is that it’s not pure chance. Participant replies: I know it’s not only chance; it’s statistics” (P15, 23 years).

This fragment synthesizes a key component of this participant’s internal conflict. The challenge of figuring out the balance between the roles of knowledge and chance in sports betting appears to be so damaging and frustrating, that this particular bettor looked to be relieved and escaped the logic of such balance by completely disregarding any role that knowledge might play in it. In his account, a sports betting entirely dominated by chance is presented as liberating and exculpatory. The recognition of a limit to his understanding, the *espinita*, represents the limit of CBT to fully account for his cognitions and beliefs about how sports betting works.

Participants differed in the way they made sense of their cognitions concerning the role of knowledge in betting, citing several obstacles in their efforts to integrate them into the new cognitions fostered by therapy. Such obstacles were external, coming from society, the environment, significant others, and/or internal beliefs originated in themselves. One major external barrier for sports bettors in order to fully

harmonise their own cognitions and beliefs with the new cognitions and beliefs promoted in CBT was the perceived existence of other sports bettors who actually win money. Professional bettors or tipsters (bettors who run a subscription-based business in which they publish predictions for members), who in theory bet rationally and are rewarded with long-term profits, posed a challenge to bettors in recovery, reinforcing their cognitive schema that addiction was the deterrent between their knowledge and winning. In fact, a few participants revealed some forms of ideation about becoming professional bettors in the process of their addiction. The next excerpt, in which one participant showed what was likely to be a memory bias, aptly illuminates the predictive ability that bettors concede to professional tipsters. The fragment condenses how bettors see their addiction as coming in the way of a potentially lucrative betting path:

“I had a tipster who gave me three tips a day... and I used to nail those tips, yes; but later I used to make many more bets of my own thinking and threw my money away” (P1, 27 years).

Tipsters are not the only external stimuli that reminds bettors that there are individuals out there who prove that winning is viable. Participants reported marketing techniques in betting shops that included: (i) printed lists of winners hanging from a board, stating nickname and prize; and (ii) occasional reminders by betting shop workers of recent big winners. The portrayal of winners in advertisements on television, radio, and online also added to the general sentiment that some bettors experienced of missing something others were indeed experiencing. All these external reassurances were strengthened by a recent development: the sharing in social media of winning tickets as a bragging mechanism (particularly *Twitter*). Winning betting slips that are published online often depict high-risk small-stakes bets resulting in huge payoffs. On other occasions, the external validation of how important knowledge is, came from the nearest in the form of friends or co-workers.

“I usually hear at work: with one euro I won a hundred. You always hear stories like this. Always about when they win, never about when they lose. That’s the taboo (P37, 39 years).

Another participant chips in: *Yes, yes. That [talking about lost bets] is a bit of a taboo” (P35, 36 years).*

When confronted about the selection bias involved in publishing the winning betting slips online (i.e., not publishing losing betting slips), and their own attention bias, bettors acknowledged such biases. It is especially telling the choice of the word *taboo*. A taboo is a prohibited or restricted social custom (Oxford English Dictionary, 2018). This means that the necessity to validate and affirm the knowledge involved in betting prevents the depiction of a more realistic picture (composed of both losses and wins), with the in-group exercising pressure to bias the true expression of betting outcomes.

The difficulties in integrating new CBT-fostered cognitive styles not only found external barriers that continued to validate bettors' old cognitive styles. Bettors also reported cognitions that could be construed as internal barriers. One of the most cited obstacles in realistically assessing the role knowledge had on their betting was their own record of wins and losses. Gamblers undergoing treatment were all affected by money losses, and without exception, saw themselves as incapable of profiting from gambling in the long-term. However, every participant recalled big wins and winning strikes. In these cases, where bettors used to favour low-risk predictions, they retained a consistent memory of winning more frequently than losing, although the sum of smaller amounts won on multiple occasions did not offset the bigger losses incurred on fewer occasions, resulting in a negative balance. Concealed in their remarks, a few sports bettors still wondered whatever could have happened in the event that their addiction never occurred. The influence these bettors attributed to knowledge was apparent in many ways, and made them struggle to fully internalise the idea that bookmakers profit from most gamblers in the long run by means of product design, and not because gamblers' lack of knowledge. For instance, participants revealed inner conflicts when talking about other forms of wagering in which they thought to be less knowledgeable:

"I used to bet a lot on greyhound and horse racing [...] I said to myself: "you're retarded", because I had made €300 from sports bets and wasted that money later on greyhounds. And I repeated to myself: don't ever gamble again on greyhounds, stick to what you know [sports]"
(P23, 24 years).

In contrast to this perceived lack of knowledge about greyhound racing, this participant subtly acknowledged his sport knowledge to predict games. Similar vestiges of pride about an individual's knowledge were observable in participants who marked the transition from *rational* betting to *impulsive*

betting in terms of losing the discipline of betting on sports they were familiar with and transitioning to unknown sports: *“you think your knowledge will earn you money, but later on you lose control and start betting on teams you don’t know about...”* (P36, 41 years). Such views provide an insight into the persistent thought of an internal locus of control over their bets. This thought was even more accentuated in those bettors with a past working in the sports industry. This was the case of two participants who were former football players, who confided how they thought their understanding of football would give them an edge over other casual bettors.

General discussion

The present paper examined how gamblers undergoing treatment for sports betting-related gambling disorder view their cognitions and beliefs about the role of knowledge in betting affects their recovery. The findings suggest persistent cognitions – unaffected by CBT cognitive restructuring – continue to operate in bettors’ minds. These cognitions appear to be associated with internal and external barriers that make it more difficult for bettors to reconcile their CBT-learned cognitions and beliefs with previously held ones.

Some erroneous general cognitions about gambling appeared to be rapidly abandoned by gamblers in therapy while other more betting-related cognitions persisted. One possible explanation could be that knowledge-based cognitions are harder to extirpate. This interpretation is consistent with the national Norwegian study of gambling habits (Lund, 2011), where high frequency gamblers playing more chance-based games (e.g., bingo cards, slot machines) showed more irrational thinking, perhaps because these games have structural characteristics that encourage superstitious thinking. Such superstitions were easier to remove by CBT. In contrast, knowledge-originated cognitions seem to appeal to a more rational side of the cognitive system, resulting in a more difficult reconfiguration. As opposed to other forms of gambling, bookmakers do not need to provide a skilful aspect for the game, because the bettors themselves can import from what they know about sports all the knowledge-based elements and try to apply them to betting. Bookmakers only need then to cater for those self-imported cognitions and amplify them. This strategy aligns well with the type of cognitive distortions promoted by bookmakers in their marketing and advertising stimuli (Lopez-Gonzalez, Estévez, & Griffiths, 2017), in which they accentuate the role of bettors in controlling the outcome of their bets, often by the use of technology (principally live

mobile technology). Such stimuli typically turn out to be the most profitable for bookmakers (Newall, 2018).

Specific sports betting-related cognitions about knowledge were not addressed by CBT in the studied sample. CBT for problem gamblers has typically considered gambling disorder as a single condition and treat it as such (Ladouceur et al., 2003). Despite the existence of numerous studies on the differences between gambling types and the prevalence of each in leading to problematic gambling (Bonnaire et al., 2017; Calado & Griffiths, 2016; LaPlante, Nelson, LaBrie, & Shaffer, 2011; Wardle et al., 2011), gambling type is not generally considered a sufficiently relevant issue as to adapt CBT to specific groups of gamblers. Perhaps the psychological background of most professionals in CBT, combined with the current emphasis on the biological determinants of substance and behavioural addictions (Koob, 2006), has led to solely focusing upon the individual psychological factors involved. This could explain why gambling product-related factors, such as its design in the perception of the product in terms of its skill-based characteristic and winning probability, have been largely ignored. These structural characteristics of gambling products (Parke & Griffiths, 2007) are bound to signify more in the near future as internet-oriented aspects of gambling evolve (Lopez-Gonzalez et al., 2018b), newer generations develop a need for more skill-based games, and the composition of the groups of help-seeking gamblers continues to become more heterogeneous (Hing et al., 2015).

Theoretical implications

Embedded in the findings of the present paper there are a number of theoretical implications to better understand how knowledge relates to significant barriers in treatment effectiveness. Figure 1 proposed a model to explain how sports bettors in recovery think their gambling disorder functions as a moderator between the balance of knowledge versus chance, and their ability to predict games. Here, the paper proposes a refined model (Figure 2), which departs from Figure 1 in one decisive manner. It posits that the balance of knowledge versus chance is (in reality) the superposition of two distinct balances: on the one hand; the balance between knowledge versus chance in sports competitions; and on the other hand, that same balance in sports betting products. In other words, sport contests are designed to provide an outcome based on the skills of contenders. The greater the skills, the greater the possibility of winning. Sports betting products are based on the prediction of such contests, but they possess their own design,

crafted by bookmakers. Odds and probabilities in betting product designs and sport contest designs are not identical. By theoretically unfolding this design, a number of internal and external obstacles surface. These obstacles make it difficult for bettors' struggles to make full sense of how knowledge operates in sports betting.

INSERT FIGURE 1 ABOUT HERE

This model argues that bettors enter therapy with two sets of relevant cognitions. Namely, cognitions about how sport is designed (e.g., in soccer: what is a likely score, who is likely to receive a red card, what does the play of a winning team look like, etc.), and cognitions about how sports betting is designed (e.g., their winning systems, their evaluation of odds with perceived value, etc.). As with any other gambler, bettors expect therapy to deactivate their irrational cognitions about sports betting. However, unlike other gambling forms in which game designs are isolated from reality and only exist within their own set of rules, betting-based gambling only exists in relation to a reality that precedes (and in theory behaves independently from) betting practice. Results suggest that bettors in CBT eliminate many cognitions about gambling but retain some cognitions about sport. In processing these two sets of cognitions as a single one, bettors get confused and find it difficult to put together coherent narratives that explain how their persistent views on the role of knowledge in sports betting (which are in fact reminiscent of their views on the role of knowledge in sport as a whole) can be integrated into the learnings of CBT. This fight to reduce cognitive dissonance finds the external and internal barriers outlined in the findings section, which moderate how well they integrate the overall model. The external validation (e.g., tipsters, social media accounts of winners, advertising) makes it more difficult for bettors to align with gambling narratives proposed in CBT sessions. This generates internal incongruity when trying to internalise and harmonise all CBT teachings, sports betting design, sport contest design, and external validation itself.

Limitations

The theoretical models outlined here are purely based on qualitative data and have not been empirically validated previously. The present paper did not utilise established gambling cognition psychometric instruments, such as the Gambling Related Cognitions Scale (GRCS) (Raylu & Oei, 2004). This fact,

combined with the self-reported nature of the collected data, could mean that the study is actually not assessing erroneous cognitions of sports bettors but ‘erroneous verbalizations’ (Toneatto et al., 1997, p. 254), that is, errors in the linguistic explanation of their attribution of causal significance to events. The use of validated psychometric tools in future studies could prevent some of these problems, and provide a baseline understanding of sports bettors’ cognitions and beliefs prior to the study, from which to build a grounded theory.

A proportion of the findings put forward in the present paper bear an important limitation regarding CBT. All the participants in the study were undergoing (or had just finished) CBT at the time of the study, but not all of them were in the same phase of the 3-5-month programme. There were differences in the level of commitment to the programme (i.e., some participants did not attend it on a weekly basis), the personal circumstances of each participant including the duration of their treatment, and the centre in which they were receiving it. Five of the six centres studied here had similar (but not identical) CBT protocols implemented by FEJAR, and another had a different protocol. This means that concluding that bettors retain persistent cognitions about the role of knowledge could have alternative explanations including that these cognitions (i) had been addressed in therapy but persisted; (ii) were unaddressed by therapy; (iii) were not addressed yet but could be in the remaining of CBT. After examining protocol documentation, the first alternative seems the most plausible, although considering the present study was not designed as a randomized trial experiment and lacks assessment tools to gauge therapeutic effects, this must remain open to interpretation.

Conclusion

In spite of its limitations, this qualitative study is the first to examine how sports bettors navigate the relevance that knowledge and chance have on their betting behaviour, and how they make sense of the role of knowledge in relation to their addiction to gambling. The study argues that bettors neutralise some gambling-related cognitive distortions during cognitive-behavioural therapy but retain others. These persistent cognitions pose a challenge for sports bettors, who try to eliminate them but encounter external validation to keep them and internal incongruences to integrate them into a coherent understanding of how gambling works. The study further argues that both sports as a contest and sports betting as a gambling product embody a balance between knowledge and chance. This balance is similar in both

sports and sports betting product designs but not identical. Consequently, this confuses sports bettors in their efforts to calibrate the positive impact their own skills and knowledge might have. Finally, it argues that these cognitions are a fertile terrain for bettors to think that their problem (i.e., gambling disorder) is the thing that interposed between their knowledge of sports/sports betting and their ability to predict game outcomes, and had it not manifested, they might have remained successful bettors.

These results have serious implications for professionals in gambling treatment, and highlights the specificity of gamblers who engage in mostly skill-based games. It also pinpoints the specificity of sports betting in that it conflates in gamblers' minds their cognitions and beliefs about gambling, *but also* about sports, and signals the importance of addressing both facets to help gamblers in recovery to harmoniously articulate these two systems of cognition.

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